REMARKS

Claims 1-24 are all the claims pending in the application.

Claims 1-3 stand rejected under 35 U.S.C. §103(a) as being unpatentable over USP 6,754,277 to Heinzelman et al. in view of USP 6,157,830 to Minde et al. or USP 5,764,651 to Bullock et al. Claims 4-10 and 12-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Heinzelman in view of Minde or Bullock and further in view of USP 6,341,224 to Dohi et al. Claim 11 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Heinzelman in view of Minde or Bullock and further in view of Dohi and further in view of USP 5,406,593 to Chennakeshu et al. Applicant respectfully traverses these rejections, and requests reconsideration and allowance of the pending claims in view of the following arguments.

Claim 1 recites a method of link adaptation in a mobile radiocommunication system, comprising selecting a coding and/or modulation scheme as a function of radio conditions represented by an average of radio measurement results, and the average includes:

-an average over a relatively short period for rapidly selecting a more rugged coding and/or modulation scheme if radio conditions are degraded rapidly, or

-an average over a relatively longer period for selecting a less rugged coding and/or modulation scheme or a more rugged coding and/or modulation scheme if radio conditions are not rapidly degraded.

The Examiner has agreed that Heinzelman fails to teach time factors or duration when factoring an average measurement, but asserted that Minde or Bullock discloses the features that

Heinzelman lacks. The Examiner then combined Heinzelman with Minde or Bullock to reject claim 1. Applicant respectfully disagrees, and asserts that the Examiner's combination of the references is improper, and even a skilled artisan were to combine the references, the combination would not result in the claimed invention.

The present application provides a method for preventing averaging radio measurements over too long a time period when radio conditions are degraded rapidly, so as to improve performance of mobile radiocommunication systems, the signals of which are subject to distortion caused by multipath propagation, thermal noise and various sources of interference. The system of the invention accomplishes this by using a shorter term average when radio conditions are degrading rapidly and a longer term average when radio conditions are not degrading rapidly. Note that this is not using a shorter term average when radio conditions are bad and a longer term average when radio conditions are not so bad, but the determining factor in the choice is the ***rate*** at which conditions are degrading.

None of the cited references teaches or suggests the use of different averages depending on the rate of degradation of conditions.

1. Heinzelman

Heinzelman provides unequal error protection channel coding for compressed video of <u>portable multimedia terminals</u> with data partitioning by using highest error protection for packet header and bit stuffing, next highest error protection for motion data, and the lowest error protection for texture data. Compressed bitstreams were channel coded to achieve the unequal error protection rates shown in Table 2 of Heinzelman. The coded sequences were sent through

a GSM channel simulator with different BER and carrier to interference ratios (C/I) shown in Table 3 of Heinzelman. By comparing the data, Heinzelman concludes that unequal error protection is able to obtain the highest quality reconstructed video for a given source rate and fixed overhead after transmission through a highly error-prone wireless channel, as shown in Figs. 6-8 of Heinzelman (Heinzelman, col. 8, lines 27-31).

Heinzelman provides six GSM channel conditions in its Table 3, but fails to teach that the GSM channel conditions are radio conditions represented by an average of radio measurement results, much less the average over a relatively short period or the average over a relatively longer period. Nor does Heinzelman teach including in the average of radio measurement results the average over a relatively short period if the radio conditions are rapidly degraded or the average over a relatively longer period if the radio conditions are not rapidly degraded.

None of other cited references supplies Heinzelman's deficiencies.

2. Minde

Minde provides a method for measuring speech quality in cellular networks. As shown in Figs. 2 and 3 of Minde, bit errors are received and detected by a mobile station (MS) 16 and a bit error rate (BER) 18 is calculated and sent to a temporal processing stage 32. A frame erasure rate (FER) 10, a received signal level (RxLev) 22, and a handover parameter 24 are also obtained from the receiver 16 and sent to the stage 32. The temporal processing stage 32 extracts temporal information from parameters by examining their previous activity during a specified time interval (Minde, col. 5, lines 45-47). For example, the mean BER during the last 5 seconds are representatives of new temporal parameters for deriving parameters more closely related to

an aspect of speech quality (Minde, col. 5, lines 52-56). A correlation stage 34 correlates the original or newly calculated temporal parameters to produce correlated parameters which are more directly related to speech quality. An Estimator stage 36 uses the correlated parameters to calculate an estimate of the perceived speech quality.

The Examiner has asserted that Minde supplies Heinzelman's deficiencies. Applicant respectfully disagrees.

Applicant asserts that the Examiner's combination of Heinzelman and Minde is improper. As discussed above, Heinzelman's purpose is to provide channel coding to protect compressed video bitstreams in harsh channel conditions, while Minde's purpose is to measure speech quality in a mobile cellular telecommunications network. Given the different goals of Heinzelman and Minde, there is no suggestion or motivation to combine the two references. There is no reason for a skilled artisan to pick the mean value of BER in Minde, which is used to estimate speech quality, and add it to Heinzelman for unequal error protection channel coding for compresses video signals.

Minde mentions obtaining mean values of BER over time intervals of different length, but does not at any time suggest that the length of the time intervals depends on the ***rate*** of degradation of the radio conditions. Thus, even if a skilled artisan were to combine Heinzelman and Minde, the combination would not result in the invention of claim 1.

3. Bullock

Bullock provides a method for detecting error rates in a synchronous optical network (SONET) data stream. As shown in Fig. 5 of Bullock, an error rate threshold is determined at

step 10, and a frame sampling window based on a known error rate is determined at step 12. At step 14, the data stream is monitored during the specified total window length, and the number of errors is counted for the duration of the total window length. If the cumulative number of errors counted in the total window length exceeds the threshold, the total window length is shortened at step 16. Otherwise, the window length is increased. When the window length falls below a minimum, a signal fail indication is generated.

The Examiner has asserted that Bullock provides Heinzelman's deficiencies. Applicant respectfully disagrees.

Applicant asserts that the Examiner's combination of Heinzelman and Bullock is improper. First, given the different purposes of the two references, there is no reason or suggestion for a skilled artisan to combine the two references. Second, Heinzelman is related to a wireless telecommunication system, but Bullock is related to an optical telecommunication system. The wireless telecommunication system and optical telecommunication system operate according to different principles. To combine the two references will have to change operation principle of at least one of the two systems. However, it is well settled in the law that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810 (CCPA 1959).

Furthermore, without going into the many differences between Bullock and the invention it should be sufficient to note that at best the counting of errors during a window is a measure of radio conditions, but not a measure of the ***rate of change*** of radio conditions. There is nothing in

Bullock which suggests that when the ***rate*** of degradation becomes too great, the duration of the time window will be changed. Thus, even if a skilled artisan were to combine the two references, the combination would not result in the invention of claim 1.

4. Dohi & Chennakeshu

Dohi provides a power controller for mobile communication system, wherein an error rate of received signal is measured by a received signal error measuring unit, and a target signal-to-interference plus noise power ratio (SIR) is changed by a target SIR decision unit using the error rate. Chennakeshu provides a method of estimating the quality of a communication channel from a differential phase angle between a received signal and the corresponding transmitted phase angle. Neither of them provides deficiencies of Heinzelman.

Thus, claim 1 and its dependent claims 2-20 are patentable. Claims 21-24 are patentable for the same reasons.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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